# ENHANCING SALT TOLERANCE OF CUCUMBER PLANT USING GRAFTING TECHNIQUE AND SOME BIOREGULATORS

By

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B.Sc. Agric. Sc. (Horticulture), Ain Shams University, 2000
M. Sc. Agric. Sc. (Plant physiology), Ain Shams University, 2006

**A thesis submitted in partial fulfillment**
**of**
**the requirements for the degree of**

## DOCTOR OF PHYLOSOPHY

**in**

## Agricultural Science
## (Plant physiology)

**Department of Agricultural Botany**
**Faculty of Agriculture**
**Ain Shams University**

**2011**

**Approval Sheet**

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# ABSTRACT

**Mohammad Ahmad Mostafa Ahmad: Enhancing Salt Tolerance of Cucumber Plant Using Grafting Technique and Some Bioregulators. Unpublished Ph.D. Thesis, Department of Agricultural Botany, Faculty of Agriculture, Ain Shams Universty, 2011.**

Two experiments were undertaken in the present study. The first experiment was conducted in pots of sandy soil in a greenhouse during the season of 2008 to evaluate the salt tolerance of different cucurbitaceous cultivars; Shintosa supreme pumpkin (*Cucurbita maxima x C. moschata*), Bottle gourd (*Lagenaria siceraria*), Gourd black seed *(Cucurbita maxima)* and pumpkin (*Cucurbita moschata*)). Salinity was applied as NaCl at 0, 2500, 3500, 4500 ppm to a base complete Hoagland nutrient solution. Obtained results showed that, Shintosa supreme pumpkin recorded the highest values of plant height, leaf area, shoots and root fresh and dry weights, and root length. Meanwhile, Shintosa supreme pumpkin showed reduction in membrane permeability, salt injury index and Na/K ratio comparing with other cucurbitaceous plants under different NaCl treatments. According to these results Shintosa Supreme pumpkin was selected to use as rootstock in the second experiment. Second experiment was conducted in a greenhouse during the two successive seasons of 2008- 2009 and 2009-2010 to investigate the effect of grafting technique, bioregulators; salicylic acid (SA) at 0.5 & 1 mM, fulvic acid (FA) at 150 & 300 ppm and sea weed extract (SWE) at 2.5 & 5% in addition to compatible solute, glycine betaine (GB) at 2.5 & 5 mM in improving salt tolerant of grafted cucumber plants (*Cucumis sativus* L. cv. falcon, Hybrid F1) under saline conditions. Grafting of cucumber on salt tolerance rootstock (Shintosa supreme pumpkin) significantly increased growth and fruits yield, leaf relative water content (LRWC) and antioxidant enzymes activity. Furthermore, grafting significantly increased

chlorophyll, carotenoid, proline and total soluble protein concentrations. Grafting reduced membrane permeability and malondialdehyde (MDA) concentration in leaves of cucumber plants under salt stress conditions. Foliar application of SWE, SA, FA and GB significantly improved growth and yield parameters, and biochemical contents of grafted cucumber plants compared to untreated grafted plants under salt conditions. The superiority was due to SWE (5%) followed by FA (300 ppm) then GB (5 mM).

**Key wards:**

Shintosa supreme pumpkin (*Cucurbita maxima x C. moschata*), cucumber (*Cucumis sativus*), grafting**,** bioregulators, salicylic acid, fulvic acid, seaweed extract, compatible solute, glycine betaine, salt stress.

## ACKNOWLEDGEMENT

First of all, great thanks and gratitude be to Allah, who guide me to this way and assist me in all my life. All words, all feelings and all praise will not be enough to thank Allah.

I owe my deepest gratitude and indebtedness to **Dr. Said Awad Mohamed Shehata,** Prof. Emeritus of Plant Physiology, Faculty of Agriculture, Ain Shams University, (Principal supervisor) who proposed work plan and provided me encouragement; guidance and continuous support of my Ph.D. study and research. I would also like to thank him for motivation which has enabled the production of this thesis. Words are not enough to express how much grateful, I am to him.

I would like express my sincere appreciation to **Dr. Sanna Abdel-Rahman Mostafa Zaglol,** Prof. of Plant Physiology, Chairman of Agriculture Bot. Dep., Faculty of Agriculture, Ain Shams University, who shared with me a lot of her expertise and research insight, who's thoughtful advise often served to give me a sense of direction during my Ph.D. studies. Her constant guidance helped me to overcome difficulties of written language during writing this thesis. Thus, she became for me the role model for a successful researcher in the field.

It is a great pleasure to express my sincere gratitude to **Dr. Amal Mohamed El-Shraiy,** Assistant Prof. of Plant Physiology, Department of Agricultural Botany, Faculty of Agriculture, Ain Shams University, for her kind help, great effort administration during my Ph.D. study specially during the experimental course of this thesis.

Thanks are given to those people mentioned hereafter, who have assisted me during I conducted the Ph.D. research; **Dr. Said Mohammed Kabiel**, Vegetable Research Institute, for providing me with seeds and for helping with preliminary development of research

proposal; **Dr. Sabry Moosa; Mr. Mohammed Abu-Alfotoh** and **Miss Hanaa Rizk Mohammed** for helping me with initial set up of enzymes activity determination.

The author also wishes to express his thanks to all members of Department of Agricultural Botany for their kindness and help that made such work possible.

I dedicate this work to my supervision committee for having brought me to a new fabulous area of research, my dear later friend **Dr. Ahmad Abd-Elrahman Eldeep** and to my family for their lifetime of love and support. I owe my deepest gratitude to my parents, my mother and my later father **Ahmad Mostafa Ahmad**, for nurturing and inspiring me to pursue post-graduate education.

## CONTENTS

# LIST OF TABLES